

**WHAT IS CLAIMED IS:**

1. An electronic device comprising a substrate and a semiconductor device, which are connected with each other by means of a Pb-free solder comprising Bi, the semiconductor device having a lead on which an Sn-Bi alloy layer comprising 1 to 20 wt% Bi is formed.
  
2. An electronic device according to claim 1, wherein the Pb-free solder comprising Bi is an Sn-Ag-Bi alloy.
  
3. An electronic device according to claim 1, wherein the lead is a TSOP lead.
  
4. An electronic device according to claim 3, wherein the Pb-free solder provides connection between said TSOP lead and said substrate, via said Sn-Bi alloy layer.
  
5. An electronic device according to claim 1, wherein the Pb-free solder provides connection between said lead and said substrate, via said Sn-Bi alloy layer.

6. An electronic device comprising a substrate and a semiconductor device, which are connected with each other by means of a Pb-free solder comprising Bi, the semiconductor device having a lead made of Cu or a Cu alloy on which an Sn-Bi alloy plating layer comprising 1 to 20 wt% Bi is formed as a surface layer.

7. An electronic device according to claim 6, wherein the Pb-free solder comprising Bi is an Sn-Ag-Bi alloy.

8. An electronic device according to claim 6, wherein the lead is a TSOP lead.

9. An electronic device according to claim 8, wherein the Pb-free solder provides connection between said TSOP lead and said substrate, via said Sn-Bi alloy layer.

10. An electronic device according to claim 6, wherein the Pb-free solder provides connection between said lead and said substrate, via said Sn-Bi alloy layer.

11. An electronic device comprising a substrate and a semiconductor device, which are connected with each other by means of a Pb-free solder comprising Bi, the semiconductor device having a lead made of Cu or a Cu alloy on which an Sn-Bi alloy layer comprising about 1 to about 20 wt% Bi is directly formed as a surface layer.

12. An electronic device according to claim 11, wherein the Pb-free solder comprising Bi is an Sn-Ag-Bi alloy.

13. An electronic device according to claim 12, wherein the Pb-free solder provides connection between said lead and said substrate, via said Sn-Bi alloy layer.

14. An electronic device according to claim 11, wherein the Pb-free solder provides connection between said lead and said substrate, via said Sn-Bi alloy layer.

15. An electronic device comprising a substrate and a semiconductor device, which are connected with each other by means of a Pb-free solder